

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 05521

CSAH NO. 2

OVER THE

MISSISSIPPI RIVER

DISTRICT 3 - BENTON COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY
COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 80)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 05521, Piers 1, 2, and 3, were found to be in good condition with no defects of structural significance observed. A band of minor concrete scaling was observed around all the piers at the waterline. The channel bottom around the substructure units consisted of firm material that was well established; however, minor scour depressions have developed at the upstream noses of Piers 1 and 2 since the previous inspection.

INSPECTION FINDINGS:

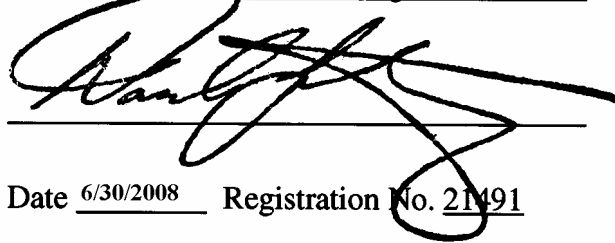
- (A) A band of minor scaling was observed at all piers from 3 feet above to 3 foot below the waterline with typical penetrations of 1/8 inch and a maximum penetration of 1/4 inch. The heaviest scaling was at the upstream nose.
- (B) A 2-foot-radius by 1-foot-deep scour depression with a minor accumulation of timber debris was observed at the upstream end of Pier 2.
- (C) The channel bottom consisted of sandy gravel and up to 5-inch-diameter cobbles with a maximum probe rod penetration of 4 inches.

RECOMMENDATIONS:

- (A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

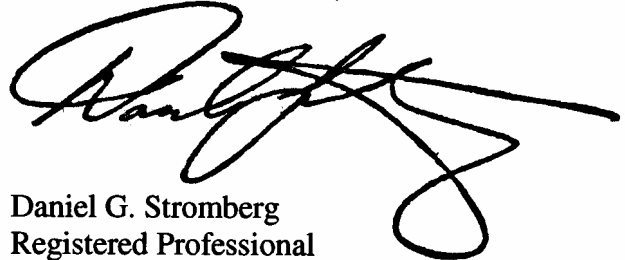
Daniel G. Stromberg

A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over two horizontal lines.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over two horizontal lines.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 05521

Feature Crossed: Mississippi River

Feature Carried: CSAH No. 2

Location: District 3 - Benton County

Bridge Description: The bridge superstructure consists of four spans of multiple welded plate girders supporting a reinforced concrete deck. The superstructure is supported by three reinforced concrete piers and two reinforced concrete abutments, all of which are founded on timber piles. The piers are numbered 1 through 3 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 15, 2007

Weather Conditions: Sunny, 70°F

Underwater Visibility: 5.0 Feet

Waterway Velocity: 0.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3.

General Shape: The piers consist of a rectangular reinforced concrete shaft with rounded ends supporting a rectangular reinforced concrete hammerhead pier cap. Each pier shaft is supported on a rectangular footing founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 9.6 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the parapet wall at the south end of Pier 1.

Water Surface: The waterline was approximately 27.1 feet below reference.
Waterline Elevation = 1014.7.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 8

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code J/91

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

 Yes X No



Photograph 1. Overall View of the Structure, Looking Southwest.



Photograph 2. View of Pier 1, Looking East.



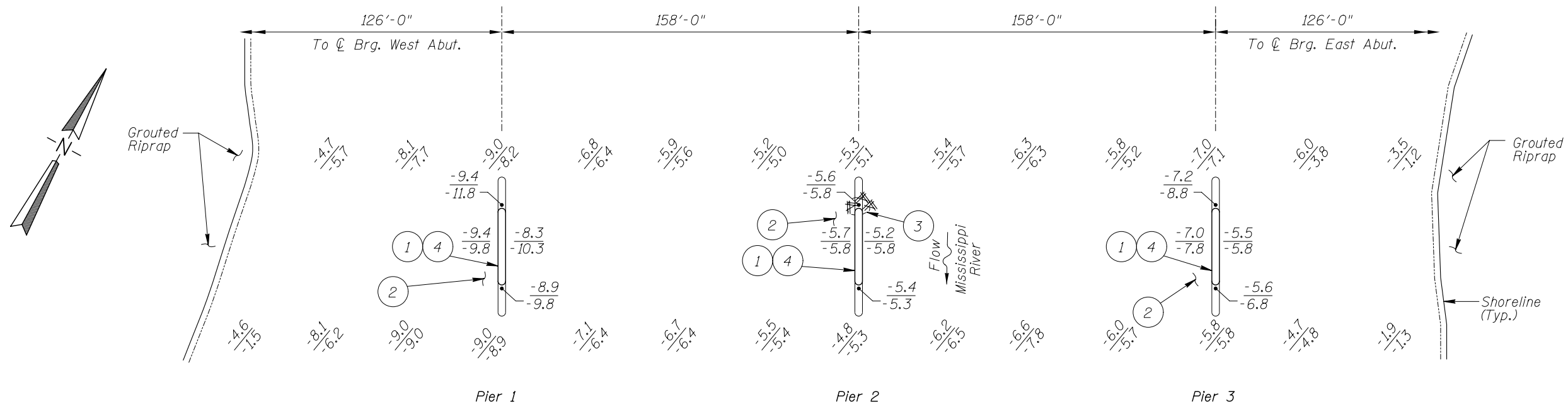
Photograph 3. View of Pier 2, Looking East.



Photograph 4. View of Pier 3, Looking East.

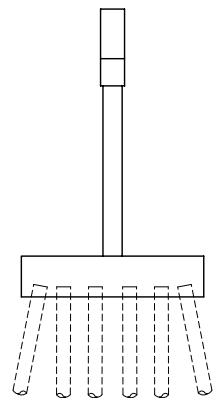


Photograph 5. Scaling (typical) at upstream nose of Pier 1, Looking Southwest.



INSPECTION NOTES:

- 1 A band of minor scaling was observed at all piers from 3 feet above to 3 feet below the waterline, with typical penetrations of 1/8 inch and a maximum penetration of 1/4 inch, with heaviest deterioration at the upstream nose.
- 2 The channel bottom consisted of sandy gravel and up to 5-inch-diameter cobbles with a maximum probe rod penetration of 4 inches.
- 3 A 2-foot-radius, 1-foot-deep scour pocket with a minor accumulation of timber debris was observed at the upstream end of Pier 2.
- 4 Above and below band of scaling concrete was smooth and sound.



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1, 2, and 3 were inspected underwater.
2. At the time of inspection on September 15, 2007, the waterline was located approximately 27.1 feet below the top of the parapet at the downstream end of Pier 1. This corresponds to a waterline elevation of 1014.7.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

Legend

- 1.7 Sounding Depth (8/15/07)
-1.9 Sounding Depth (9/27/02)
- Timber Debris

Note:

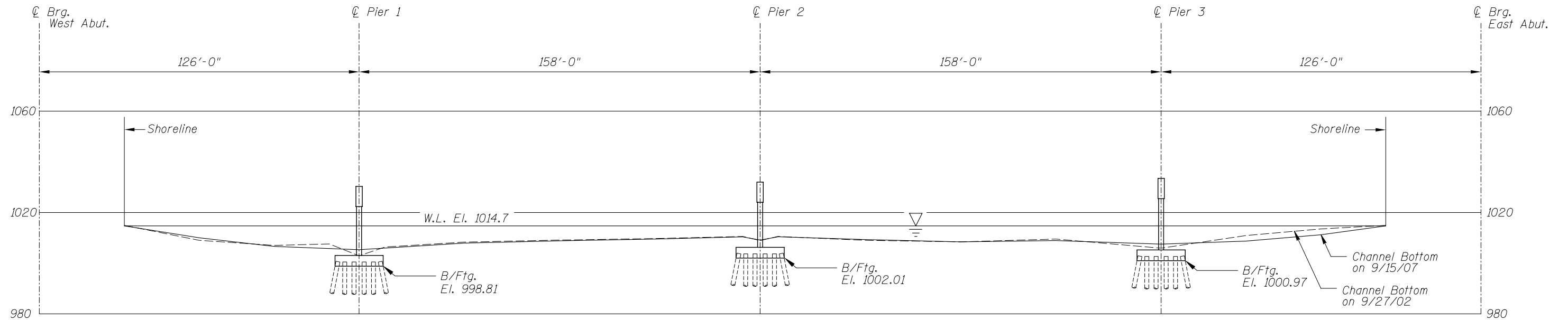
All soundings based on 2007 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION

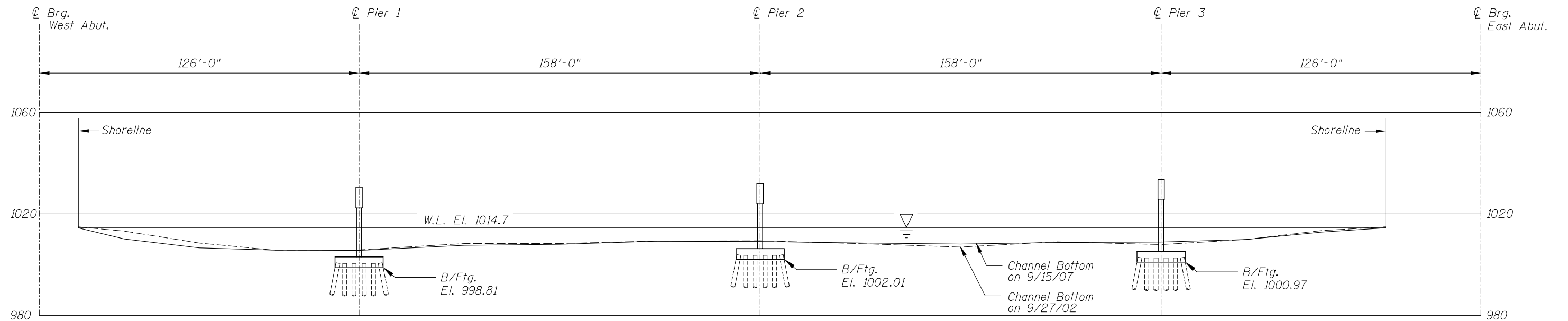
STRUCTURE NO. 05521
OVER THE MISSISSIPPI RIVER
DISTRICT 3, BENTON COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: SEPT. 2007
Checked By: MDK		Scale: NTS
Code: 52210080		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 05521 OVER THE MISSISSIPPI RIVER DISTRICT 3, BENTON COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: SEPT. 2007
Checked By: MDK		Scale: 1"=40'
Code: 52210080		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 15, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 05521 WEATHER: Sunny, 70°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins

EQUIPMENT: Scuba, Probe Rod, Lead Line, Sounding Pole, Fathometer, U/W Light,
Scraper, Camera

TIME IN WATER: 5:00 p.m.

TIME OUT OF WATER: 5:30 p.m.

WATERWAY DATA: VELOCITY 0.5 f.p.s.

VISIBILITY 5.0 feet

DEPTH 9.6 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1, 2, and 3

REMARKS: Overall, above and below the band of scaling around the waterline, the concrete
of the pier shafts was smooth and sound. The band of minor scaling was observed at all piers
from 3 feet above to 3 foot below the waterline with up to 1/4 inch penetration. Minor scour
pockets were observed at the upstream noses of Piers 1 and 2 with some minor timber drift at
Pier 2 also. It was noted that the slopes at the abutments were well protected with grouted
riprap.

FURTHER ACTION NEEDED: YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS)
interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 05521
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
WATERWAY CROSSED Mississippi River

INSPECTION DATE August 15, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	9.6'	N	8	N	9	N	8	8	8	8	N	7	8	N	N	N	N	N
	Pier 2	5.7'	N	8	N	9	N	8	7	N	N	N	7	8	N	N	N	N	N
	Pier 3	7.2'	N	8	N	9	N	8	8	8	8	N	7	8	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, above and below the band of scaling around the waterline, the concrete of the pier shafts was smooth and sound. The band of minor scaling was observed at all piers from 3 feet above to 3 foot below the waterline with up to ¼ inch penetration. Minor scour pockets were observed at the upstream noses of Piers 1 and 2 with some minor timber drift at Pier 2 also. It was noted that the slopes at the abutments were well protected with grouted riprap.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.